

PREFACE

The 12th annual Midwest Solid State Theory Symposium held in St. Paul, Minnesota in 1984 attracted a very high quality of both young and established theorists from academic and industrial institutions. Though the symposium had not been planned with a theme, the contributions of the speakers complemented each other very nicely. For the proceedings, we have asked the speakers to make their contributions as pedagogically readable as possible and we think that they have largely succeeded. The result reviews a wide but related set of current interests in condensed matter theory.

We first present papers based on the talks by L. W. Burch, John Smith and Jack Dow on surface phases, adhesion and Schottky barriers in which the underlying model of the surface is planar. In the next contributions, on the Laplacian roughening model, equilibrium crystal shapes and dendritic growth by David Bruce, Michael Wortis and Eschel Ben-Jacob respectively one studies decidedly non planar interfaces. This leads naturally to descriptions of material in the talks by Joseph Straley, Rajiv Kalia, and P. L. Taylor on structure of defects in glasses, two dimensional glasses and polymers. Finally, we have papers on the classical dynamics (in networks by Michael Thorpe and in diffusion on fractals by Hisao Nakanishi) and the electron dynamics (based on talks by C. M. Soukoulis, Barry Kunz, Mike Lee, David Stroud, and Craig Davis) of disordered systems.

The symposium is an informal conference designed for the pleasure and enlightenment of the participants and particularly for the students and young investigators among them. It is our hope that these proceedings will serve similar purposes for their readers.

We are grateful to the Argonne Universities Association, the Graduate School and Physics Department of the University of Minnesota and Argonne National Laboratories for supporting the symposium financially. The symposium also owed much to Zlatko Tesanovic and David Price, who served on the local committee, to the participants including especially the more than 25 who contributed to the poster session and to Lockwood Carlson of 3M company, who discussed the role of theoretical physics in industry in a well received afterdinner talk.

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